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## PATENT ABSTRACTS OF JAPAN

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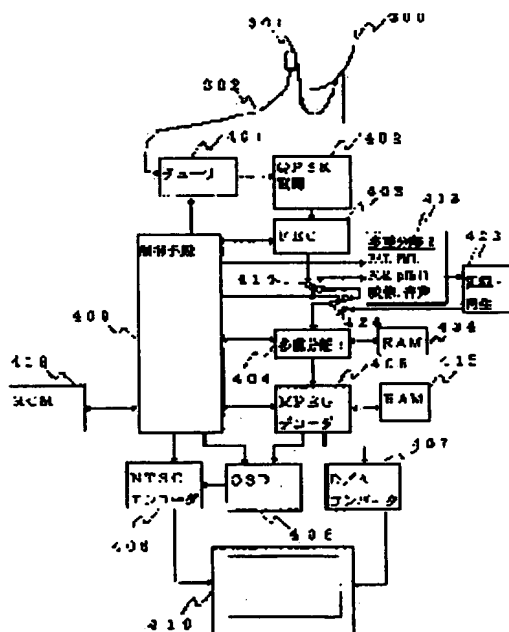
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### (54) RECEIVING OF DIGITAL BROADCASTING SIGNAL AND RECORDING AND REPRODUCING DEVICE

#### (57)Abstract:

**PROBLEM TO BE SOLVED:** To immediately reproduce without a viewer performing a complicated operation by recording a broadcasting program with a digital signal multiplexed in a packet format and also extracting and recording data that is needed when the viewer designates and reproduces his desired program at the time of reproduction in such cases.

**SOLUTION:** When a signal that is received through a QPSK demodulating part 402 is recorded in a recording and reproducing part 423, a 2nd multiplex separating part 413 extracts a desired multiplexed signal such as a PAT, PMT, video, sound, etc., which are defined by an MPEG2 international standard, converts it into a transmission rate that adjusts to recording and reproduction and sends it to the part 423. At the time of reproduction, a 1st multiplex separating part 404 receives a reproduced signal via a switch 424, recognizes a channel number by referring to the PAT, recognizes a packet ID of video and sound by referring to the PMT and sends a desired video and sound stream to an MPEG2 decoder 405.



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**CLAIMS**

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**[Claim(s)]**

[Claim 1] In the system which carries out multiplex to one bit string of the packet format which makes digital information all picture, voice data, etc., and was defined beforehand, and is transmitted to it A channel decoding means to get over to the bit string of the format which receives the transmitted digital information at least and was defined beforehand, The 1st packet separation means which extracts the packet specified from the aforementioned bit string, A source decoding means to carry out the decode of the informations, such as a picture, voice data, etc. outputted from the aforementioned packet separation means, and to output as a television signal, While it has a control means to analyze the information packet outputted from the packet separation means of the above 1st, and to control a system The 2nd packet separation means which newly extracts the packet specified from the output bit string of the aforementioned channel decoding means, A speed-conversion means to change the transmission rate of the bit string outputted from the packet separation means of the above 2nd, An interface means to change the output of the aforementioned speed-conversion means into the I / O form of external record / regeneration device is established. The receiving set of the digital broadcast signal characterized by considering as the configuration which can decode, having outputted the input bit string from the aforementioned interface means to the packet separation means of the above 1st, and having used the picture and the voice data signal as the television signal.

[Claim 2] It is the receiving set of the digital broadcast signal characterized by considering as the configuration which extracts packets, such as a picture, voice data, etc. defined with PAT (Program Association Table) packet, one or more PMT (Program Specific Information) packets, and the above PMT with which the packet separation means of the above 2nd was defined by MPEG 2 specification in the receiving set of the digital broadcast signal of a claim 1.

[Claim 3] It is the receiving set of the digital broadcast signal characterized by considering as the configuration which determines the picture, voice data, etc. reproduced including a means by which the aforementioned control means compares the above PAT with the above PMT in the receiving set of the digital broadcast signal of a claim 2 at the time of the bit string input from external record / regeneration device, and which carries out an appearance control.

[Claim 4] It is the receiving set of the digital broadcast signal characterized by establishing a means to change packet ID of the aforementioned PMT packet into the value which was able to be defined beforehand while packets, such as a picture, voice data, etc. defined by PMT packet and the aforementioned PMT packet as which the packet separation means of the above 2nd was determined by MPEG 2 specification at least in the receiving set of the digital broadcast signal of a claim 1, are extracted.

[Claim 5] It is the receiving set of the digital broadcast signal characterized by the thing which determines the picture, voice data, etc. which extracts PMT with packet ID as which the aforementioned control means was beforehand determined in the receiving set of the digital broadcast signal of a claim 4 at the time of the bit string input from external record / regeneration device, and is reproduced according to the above PMT, and to do for an appearance control.

[Claim 6] It is the receiving set of the digital broadcast signal characterized by including a means to change packet IDs, such as aforementioned picture, voice data, etc., into the value which was able to be defined beforehand while the packet separation means of the above 2nd extracts packets, such as a

picture and voice data, in the receiving set of the digital broadcast signal of a claim 1.

[Claim 7] It is the receiving set of the digital broadcast signal characterized by considering as the configuration which extracts the picture, voice data, etc. with packet ID as which the aforementioned control means was beforehand determined in the receiving set of the digital broadcast signal of a claim 6 at the time of the bit string input from external record / regeneration device with the packet separation means of the above 1st, and which carries out an appearance control.

[Claim 8] It is the receiving set of the digital broadcast signal characterized by considering as the configuration which inserts the new packet which specifies packet IDs, such as aforementioned picture, voice data, etc., while the packet separation means of the above 2nd extracts packets, such as a picture and voice data, in the receiving set of the digital broadcast signal of a claim 1.

[Claim 9] The new packet which specifies packet IDs, such as aforementioned picture, voice data, etc., in the receiving set of the digital broadcast signal of a claim 8 is the receiving set of the digital broadcast signal characterized by having the same packet ID as PAT defined by MPEG 2 specification.

[Claim 10] It is the receiving set of the digital broadcast signal characterized by considering as the configuration which extracts the new packet the aforementioned control means specifies packet IDs, such as aforementioned picture, voice data, etc., to be in the receiving set of the digital broadcast signal of a claim 8 at the time of the bit string input from external record / regeneration device with the packet separation means of the above 1st, and which carries out an appearance control.

[Claim 11] It is the receiving set of the digital broadcast signal characterized by considering as the configuration which extracts the program information packet which describes content, such as aforementioned picture, voice data, etc., while packets, such as a picture, voice data, etc. defined with PAT packet, PMT packet, and the above PMT with which the packet separation means of the above 2nd was defined by MPEG 2 specification at least in the receiving set of the digital broadcast signal of a claim 1, are extracted.

[Claim 12] It is the receiving set of the digital broadcast signal characterized by considering as the configuration which determines packets, such as a picture, voice data, etc. from which the aforementioned control means is beforehand extracted and extracts the aforementioned program information packet with the packet separation means of the above 1st based on the aforementioned program information packet, in the receiving set of the digital broadcast signal of a claim 11 at the time of the bit string input from external record / regeneration device, and which carries out an appearance control.

[Claim 13] It is the receiving set of the digital broadcast signal characterized by being the specific program information packet which described the information on packets, such as a picture, voice data, etc. which extracts especially the aforementioned program information packet by the 2nd packet separation means in the receiving set of the digital broadcast signal of a claim 11.

[Claim 14] It is the receiving set of the digital broadcast signal characterized by to consider as the configuration which determines packets, such as a picture, voice data, etc. which extracts beforehand the program information packet of the aforementioned specialization [ the aforementioned control means ], and extracts it with the packet separation means of the above 1st in the receiving set of the digital broadcast signal of a claim 13 based on the aforementioned specific program information packet at the time of the bit string input from external record / regeneration device, and which carries out an appearance control.

[Claim 15] In the system which carries out multiplex to one bit string of the packet format which makes digital information all picture, voice data, etc., and was defined beforehand, and is transmitted to it A channel decoding means to get over to the bit string of the format which receives the transmitted digital information at least and was defined beforehand, The 1st packet separation means which extracts the packet specified from the aforementioned bit string, A source decoding means to carry out the decode of the informations, such as a picture, voice data, etc. outputted from the aforementioned packet separation means, and to output as a television signal, While it has a control means to analyze the information packet outputted from the packet separation means of the above 1st, and to control a system The 2nd packet separation means which newly extracts the packet specified from the output bit string of the aforementioned channel decoding means, A speed-conversion means to change the transmission rate of the bit string outputted from the packet separation means of the above 2nd, The digital recording and the regeneration means which records and reproduces the output of the

aforementioned speed-conversion means with a digital signal are established. The reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by considering as the configuration whose decode outputs the input bit string from aforementioned digital recording and regeneration means to the packet separation means of the above 1st, makes a picture and a voice data signal a television signal, and is enabled.

[Claim 16] It is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by considering as the configuration which extracts packets, such as a picture, voice data, etc. defined with PAT packet, PMT packet, and the above PMT with which the packet separation means of the above 2nd was defined by MPEG 2 specification in the reception of the digital broadcast signal of a claim 15, and record and a regenerative apparatus.

[Claim 17] It is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by considering as the configuration which determines the picture, voice data, etc. reproduced including a means by which the aforementioned control means compares the above PAT with the above PMT in a reception of the digital broadcast signal of a claim 16, and record and a regenerative apparatus at the time of the bit string regeneration from the aforementioned record / regeneration means, and which carries out an appearance control.

[Claim 18] It is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by establishing a means to change packet ID of the aforementioned PMT packet into the value which was able to be defined beforehand while packets, such as a picture, voice data, etc. defined by PMT packet and the aforementioned PMT packet as which the packet separation means of the above 2nd was determined by MPEG 2 specification at least in the reception of the digital broadcast signal of a claim 15, and record and a regenerative apparatus, are extracted.

[Claim 19] It is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by to consider the aforementioned control means as the configuration which determines the picture, the voice data, etc. which extracts PMT with packet ID defined beforehand, and is reproduced according to the above PMT, and which carries out an appearance control in a reception of the digital broadcast signal of a claim 18, and record and a regenerative apparatus at the time of the bit string regeneration from the aforementioned record / regeneration means.

[Claim 20] It is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by including a means to change packet IDs, such as aforementioned picture, voice data, etc., into the value which was able to be defined beforehand while the packet separation means of the above 2nd extracts packets, such as a picture and voice data, in a reception of the digital broadcast signal of a claim 15, and record and a regenerative apparatus.

[Claim 21] It is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by the thing which extracts the picture, voice data, etc. with packet ID as which the aforementioned control means was beforehand determined in the reception of the digital broadcast signal of a claim 20, and record and a regenerative apparatus at the time of the bit string regeneration from the aforementioned record / regeneration means with the packet separation means of the above 1st, and to do for an appearance control.

[Claim 22] It is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by considering as the configuration which inserts the new packet which specifies packet IDs, such as aforementioned picture, voice data, etc., while the packet separation means of the above 2nd extracts packets, such as a picture and voice data, in a reception of the digital broadcast signal of a claim 15, and record and a regenerative apparatus.

[Claim 23] The new packet which specifies packet IDs, such as aforementioned picture, voice data, etc., in a reception of the digital broadcast signal of a claim 22, and record and a regenerative apparatus is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by having the same packet ID as PAT defined by MPEG 2 specification.

[Claim 24] It is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by considering the aforementioned control means as the configuration which extracts the new packet which specifies packet IDs, such as aforementioned picture, voice data, etc., with the packet separation means of the above 1st, and which carries out an appearance control in a reception of the digital broadcast signal of a claim 22, and record and a regenerative apparatus at the time of the bit string regeneration from the aforementioned record / regeneration means.

[Claim 25] It is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by to consider as the configuration which extracts the program information packet which describes content, such as aforementioned picture, voice data, etc., while packets, such as a picture, voice data, etc. defined with PAT packet, PMT packet, and the above PMT with which the packet separation means of the above 2nd was defined by MPEG 2 at least in the reception of the digital broadcast signal of a claim 15, and record and a regenerative apparatus, be

[Claim 26] They are the reception, the record, and the regenerative apparatus of a digital broadcast signal characterized by to consider [ in a reception of the digital broadcast signal of a claim 25, and record and a regenerative apparatus ] the aforementioned control means as the configuration which determines packets, such as the picture, voice data, etc. which extracts the aforementioned program information packet beforehand and is extracted with the packet separation means of the above 1st based on the aforementioned program information packet, and which carries out an appearance control at the time of the bit string regeneration from the

[Claim 27] It is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by being the specific program information packet which described the information on packets, such as a picture, voice data, etc. which extracts especially the aforementioned program information packet by the 2nd packet separation means in a reception of the digital broadcast signal of a claim 25, and record and a regenerative apparatus.

[Claim 28] They are the reception, the record, and the regenerative apparatus of a digital broadcast signal characterized by to consider [ in a reception of the digital broadcast signal of a claim 27, and record and a regenerative apparatus ] the aforementioned control means as the configuration which determines packets, such as the picture, the voice data, etc. which extracts the aforementioned specific program information packet beforehand, and extracts with the packet separation means of the above 1st based on the aforementioned specific program information packet, and which carries out an appearance control at the time of the bit string

[Claim 29] The receiving set of the digital broadcast signal characterized by establishing a means to suspend the output of the aforementioned interface means in the receiving set of the digital broadcast signal of a claim 1 when the aforementioned control means extracts record improper informations, such as aforementioned picture, voice data, etc.

[Claim 30] The receiving set of the digital broadcast signal characterized by establishing a means to suspend the function of the packet extraction means of the above 2nd in the receiving set of the digital broadcast signal of a claim 1 when the aforementioned control means extracts record improper informations, such as aforementioned picture, voice data, etc.

[Claim 31] The reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by establishing a means to suspend the output of the aforementioned speed-conversion means in a reception of the digital broadcast signal of a claim 15, and record and a regenerative apparatus when the aforementioned control means extracts record improper informations, such as aforementioned picture, voice data, etc.

[Claim 32] The reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by establishing a means to suspend the function of the packet extraction means of the above 2nd in a reception of the digital broadcast signal of a claim 15, and record and a regenerative apparatus when the aforementioned control means extracts record improper informations, such as aforementioned picture, voice data, etc.

[Claim 33] PAT packet as which the packet separation means of the above 2nd was determined by MPEG 2 specification at least in the receiving set of the digital broadcast signal of a claim 1, While packets, such as a picture, voice data, etc. defined with PMT packet and the above PMT, are extracted The receiving set of the digital broadcast signal characterized by establishing a means to detect the transmission rate of the signal outputted from the packet separation means of the above 2nd while considering as the configuration which extracts the program information packet which describes content, such as aforementioned picture, voice data, etc.

[Claim 34] The control means of a claim 33 is the receiving set of the digital broadcast signal characterized by considering as the configuration in which the 2nd carries out a packet separation means control so that an extraction of the specific packet beforehand set up when it was detected by the transmission rate detection means that the transmission rate of the signal which the packet

separation means of the above 2nd outputs exceeded the value set up beforehand may be stopped.  
[Claim 35] In a reception of the digital broadcast signal of a claim 15, and record and a regenerative apparatus While the packet separation means of the above 2nd extracts packets, such as a picture, voice data, etc. defined with PAT packet, PMT packet, and the above PMT which were defined by MPEG 2 specification at least The reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by establishing a means to detect the transmission rate of the signal outputted from the packet separation means of the above 2nd while considering as the configuration which extracts the program information packet which describes content, such as aforementioned picture, voice data, etc.

[Claim 36] The control means of a claim 35 is the reception of a digital broadcast signal, and the record and the regenerative apparatus which are characterized by to consider as the configuration in which the 2nd carries out a packet separation means control so that an extraction of the specific packet beforehand set up when it was detected by the transmission rate detection means that the transmission rate of the signal which the packet separation means of the above 2nd outputs exceeded the value set up beforehand may be stopped.

[Claim 37] The receiving set of the digital broadcast signal characterized by establishing a means to suspend the output of the aforementioned speed-conversion means in the receiving set of the digital broadcast signal of a claim 1 when the aforementioned control means extracts record improper informations, such as aforementioned picture, voice data, etc.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] Especially this invention relates to the reception and record regenerative apparatus of a digital broadcast signal which record with a digital signal and are reproduced about a reception and record regenerative apparatus of a television signal.

[0002]

[Description of the Prior Art] The receiving system and record regenerative apparatus which receive and record the digital signal with which multiplex [ of two or more informations ] is carried out, and they are transmitted as technique which records the conventional digital signal and is reproduced are described by JP,8-98164,A. In the aforementioned prior art, the receiving system which consists of a receiving means to receive the digital information signal with which two or more informations are multiplexed and transmitted, and to choose the information on desired, and a record means to record the information received with the above-mentioned receiving means is described. Moreover, in case the digital signal with which multiplex [ of two or more informations ] is carried out, and they are transmitted is received and a program is shown, the technique which chooses a desired program is stated to JP,8-56350,A. In the aforementioned conventional technique, while a packet identifier is added to two or more programs, respectively and they are packet-ized, the transmission control data in which the correspondence relation between the aforementioned program and the aforementioned packet identifier is shown are also packet-ized, and the equipment which searches for each program out of the multiplexed signal which each of these packets are multiplexed and is transmitted is described.

[0003]

[Problem(s) to be Solved by the Invention] In the conventional technique currently stated by above-mentioned JP,8-98164,A, how to separate only the information about a desired program from the information by which multiplex was carried out at the time of regeneration of the recorded program, and reproduce is not described. A search means to take out and show a desired signal from the digital signal by which multiplex was carried out in the conventional technique currently stated by JP,8-56350,A on the other hand is described. However, although it is common that it is reproducible even if it does not carry out especially other operations only by pushing the switch for regeneration when it is going to reproduce the program recorded on VTR of a certain analog method, for example from the former, it receives. Even if it combines the technique of the digital information signal currently stated by above-mentioned JP,8-98164,A, and the technique currently stated by JP,8-56350,A, in case it reproduces, you have to perform troublesome operation of a program search for example, etc. The technique of reproducing the desired program recorded immediately was unrealizable only by pushing one switch like the above-mentioned analog method VTR.

[0004] this invention aims at offering the reception and record regenerative apparatus of a digital broadcast signal which can reproduce immediately the program recorded with the digital signal, without carrying out troublesome operation like the above-mentioned analog method VTR.

[0005]

[Means for Solving the Problem] In the system which carries out multiplex to one bit string of the packet format which makes digital information all picture, voice data, etc., and was defined beforehand, and is transmitted to it A channel decoding means to get over to the bit string of the format which



receives the transmitted digital information at least and was defined beforehand, The 1st packet separation means which extracts the packet specified from the aforementioned bit string, A source decoding means to carry out the decode of the informations, such as a picture, voice data, etc. outputted from the aforementioned packet separation section, and to output as a television signal, While it has a control means to analyze the information packet outputted from the packet separation means of the above 1st, and to control a system The 2nd packet separation means which newly extracts the packet specified from the output bit string of the aforementioned channel decoding means, A speed-conversion means to change the transmission rate of the bit string outputted from the packet separation means of the above 2nd, It considered as the configuration which can decode, having established an interface means to change the output of the aforementioned speed-conversion means into the I / O form of external record / regeneration device, having outputted the input bit string from the aforementioned interface means to the packet separation means of the above 1st, and having used the picture and the voice data signal as the television signal.

[0006]

[Embodiments of the Invention] The example of this invention is explained using a drawing.

[0007] Drawing 1 is drawing showing a reception of the digital broadcast signal in this invention, and the block configuration of a record regenerative apparatus. In the following explanations, although an antenna 300 shows the example which receives the satellite-broadcasting Hertzian wave by which digital modulation was carried out by the Quadrature PhaseShift Keying (following QPSK and brief sketch) method, it limits the transmitting method used by this invention by this to satellite broadcasting, and does not limit a modulation technique to QPSK method. Moreover, although the example using Moving Picture Experts Group2 (following MPEG 2 and brief sketch) which is an international canonical as compression and the extension method of a signal is shown, the compression and the extension method of a signal which are used by this invention by this are not limited to MPEG 2.

[0008] The converter from which the Hertzian wave on which an antenna and 301 received 300 in drawing 1 is changed into a tuner input signal, 302 a tuner and 402 for a cable and 401 QPSK recovery circuit, Forward Error Correction to which 403 corrects the error of the signal accompanied by a transmission (following FEC and brief sketch), 414 and 424 the 2nd demultiplexing section and 423 for a switch and 413 The record regeneration means of a signal, 404 MPEG 2 decoder and 406 for the 1st demultiplexing section and 405 A video encoder, For 407, as for On Screen Display (following OSD and brief sketch) and 409, a D/A converter and 408 are [ a control means and 410 ] television. RAM (Random Access Memory) for the 1st demultiplexing section 404 and MPEG 2 decoder 405 developing data respectively, as for 434 and 415 and 419 are ROMs (ReadOnly Memory) which memorized the program of the control means 409 of operation.

[0009] In drawing 1 , an antenna 300 receives, the Hertzian wave transmitted from the satellite (not shown) is changed into a tuner input signal by the converter 301, and it inputs into a tuner 401 through a cable 302. In the example shown in drawing 1 , a tuner 401 tunes in and outputs a desired signal from an input signal according to a setup of the control means 409. It gets over in QPSK recovery circuit 402, and the output of the aforementioned tuner 401 is inputted into FEC403. FEC403 performs error correction of the input digital signal accompanied by a transmission.

[0010] The operation at the time of inputting into the 1st demultiplexing section 404 the digital signal which performs error correction of an input signal as mentioned above, and was obtained through switches 414 and 424 is explained. The satellite digital broadcast explained by this invention has the characteristic feature that it can carry out multiplex [ of two or more programs ] in one Hertzian wave which the transponder (not shown) for a Hertzian wave relay generally carried in the satellite relays. The 1st demultiplexing section 404 chooses a desired program out of this program by which multiplex was carried out. The signal separated in the 1st demultiplexing section 404 is inputted into the MPEG 2 decoder 405. The MPEG 2 decoder 405 elongates the compressed digital signal, and reproduces the digital video signal and digital sound signal before compression. A digital sound signal is inputted into the video encoder 406 for the reproduced digital video signal through the OSD circuit 408 at D/A converter 407. The video encoder 406 changes an input digital video signal into an analog video signal, and outputs it to television 410. On the other hand, D/A converter 407 changes an input digital sound signal into an analog sound signal, and outputs it to television 410. The above-mentioned operation is controlled by control means 409 to operate by the program memorized to ROM419.

[0011] In the above-mentioned explanation, the example of the general procedure of separating the program information on desired in the 1st demultiplexing section 404 is explained using drawing 2 and the drawing 3. The signal inputted into the 1st demultiplexing section 404 is the configuration that multiplex [ of the packet shown in drawing 2 (A) ] was carried out. A multiplex example is shown in drawing 2 (B). An operation which explains below the signal multiplexed as shown in drawing 2 (B) by processing in the 1st demultiplexing section 404 is performed. The example of the operation in the demultiplexing section is shown in drawing 3. The organization channel of the program which a televisioner wants to watch first in step 201 is inputted. It is equivalent to the television channel which an organization channel is the way of calling which collected the picture which constitutes one program, voice, etc., and is said by the conventional analog broadcasting. Moreover, one frequency to which multiplex [ of two or more programs ] was generally carried out in the digital broadcast is called physical channel. Next, PAT (Program Association Table) contained in the multiplexed signal (it is written as =Transport Stream and following TS) which has received in step 202 now is received. In addition, PAT is one of the tables in PSI (Program Specific Information) specified by MPEG 2 specification which is an international canonical. A desired organization channel is searched with step 203 out of PAT which received at step 202. If there is a desired organization channel, it will move to step 207. When there is no desired organization channel, it shifts to step 204, and it is one of the PSIs and shifts to the physical channel which acquired the physical channel in which the organization channel of a reception and a request is contained in NIT (Network Information Table) the relation between an organization channel and a physical channel is described to be, and was acquired in step 204 at the following step 205. A conversion of a physical channel is performed by setting up the frequency which should be tuned in from the control means 409 to a tuner 401, as drawing 1 was shown in the actual circuit. Then, PAT of TS in the physical channel after a conversion is received at step 206. If PAT is received, PID (Packet ID) of PMT (Program Map Table) PIDs which constitute the organization channel inputted in step 207, such as a picture and voice, are described to be will be acquired from PAT, and PMT which has aforementioned PID will be received. However, PMT is one of the tables of PSI, and PID is a packet identifier contained in the HDR of a packet. Since PIDs, such as PCR (Program Clock Reference) which shows the picture, the voice, and the hour entry which constitute each organization channel contained in PMT at TS under reception, are described, in step 208, PIDs, such as a picture of a desired program, voice, and PCR, are acquired. It decodes by setting PID acquired after that as the 1st demultiplexing means 404 in step 209, and inputting a desired picture and an audio stream into a reception and the MPEG 2 decoder 405.

[0012] While the video signal which decoded by the operation explained above is processed with NTSC encoder through OSD408 and changing into an analog signal, the program for which the televisioner wished in changing a sound signal into an analog signal by D/A converter 407, and inputting into television 410 can be shown.

[0013] Next, the procedure which reproduces the signal which recorded the signal received for the record regeneration means 423 through a switch 414 and the 2nd demultiplexing section 413, and was recorded through the switch 424 from the record regeneration means 423 is explained.

[0014] When recording a signal on the record regeneration means 423, it changes so that a switch 414 may connect the 2nd demultiplexing section 413 with FEC403 according to the control from the control means 409. The 2nd demultiplexing section 413 is a means which extracts only data required in order that a televisioner may reproduce only a desired program at the time of regeneration after recording. In the example of drawing 1, only the information about a desired program (program to which it is viewing and listening now) is extracted among program Seki informations with PCR (Program Clock Reference) which is data in which the hour entry which is needed by the MPEG 2 decoder 405 in addition to each TSs, such as PAT mentioned above, PMT, a picture, and voice, is shown.

[0015] An example of the configuration of the 2nd demultiplexing section 413 is shown in drawing 13. It constitutes from a demultiplexing means 4131 to extract the information on desired in drawing 13, and a speed-conversion means 4132 which carries out the speed conversion of the transmission rate of the output signal of the demultiplexing means 4131 so that the aforementioned record regeneration means may be suited. The speed-conversion means 4132 is specifically FIFO (Fast in Fast Out) memory.

[0016] Furthermore, other examples of a configuration of the 2nd demultiplexing section 413 are shown in drawing 14. When the signal which 4133 is the interface means of the 2nd demultiplexing section 413 and the record regeneration means 423, for example, is outputted from the speed-conversion means

4132 in drawing 14 is a parallel signal, it is a means to change into a serial signal. The signal extracted by the 2nd demultiplexing section 413 of a configuration like the example shown in the drawing 13 or the drawing 14 is recorded on the record regeneration means 423. At the time of regeneration, the signal reproduced with the record regeneration means 423 is inputted into the demultiplexing means 404 through a switch 424. When the demultiplexing means 404 reproduces the signal recorded on the record regeneration means 423, it is operated in the procedure which controls from the control means 409 and is shown in drawing 4. Hereafter, the operation is explained. In addition, PID which shows that it is generally program related information is not based on a program, but is shown by the specific value, and explains this as a premise also in this example.

[0017] If a signal is inputted from the record regeneration means 423, the 1st demultiplexing means 404 will acquire first the number of the organization channel which receives desired program related information and is described by desired program related information according to the control from the control means 409, as shown in step 441. Next, PAT is received in step 442. Since the channel number of the organization channel currently recorded in this phase is known in step 441, PID of PMT PIDs, such as a picture of the program recorded in the following step 443 and voice, are described to be can acquire immediately. The following procedures are the same with having explained in drawing 3.

[0018] As explained above, without a televiewer doing complicated operation, demultiplexing can be carried out immediately, it can decode and the program reproduced from the record regeneration means 423 which recorded the program in the state of the digital signal by which multiplex was carried out in this example can be shown. Furthermore, since desired program related information is recorded, fullness of the service using the information about the program which is one of the characteristic features of a digital broadcast can be aimed at.

[0019] The 2nd example of this invention is shown using drawing 5. Although the 2nd demultiplexing section 413 is extracting only the program Seki information on desired in the example of drawing 1, in the example of drawing 5, distinction of whether to be an information about a desired program is taken as the configuration which extracts and records all program related information, without carrying out.

[0020] The procedure of processing the regenerative signal from the record regeneration means 423 at the time of using the configuration of the example of drawing 5 is shown in drawing 6. The procedure of the procedure of drawing 6 which acquires an organization channel from the program related information of a request of step 441 among the procedures shown in drawing 4 is lost, and it is confirmed whether the information on an organization channel is in agreement with PMT on which PID described by PAT is recorded in step 601. An operation of step 601 is repeated, and if in agreement, it will move to an operation of step 602, until it is in agreement, if not in agreement. The next operation is the same as that of step 443 of drawing 4 or subsequent ones.

[0021] According to the example of drawing 5, the circuit arrangement of the 2nd demultiplexing section 413 can be simplified from the case of the example of drawing 1, and fullness of a service can be aimed at using the information about the program described by program related information like the case where it is the example of drawing 1.

[0022] The 3rd example of this invention is shown in drawing 7. That the example of drawing 7 differs from the example of drawing 5 is the point of not extracting program related information but having extracted only the data of PAT, PMT, PCR and a picture, and voice. Thereby, the configuration of the 2nd demultiplexing section 413 can be further simplified from the case of the example of drawing 5.

[0023] The 4th example of this invention is shown in drawing 8. That that the example of drawing 8 differs from the example of drawing 1 extracts by the 2nd demultiplexing section 413 is the point of having established PID rewriting means 433 while there is only PMT, PCR, a picture, and voice. That is, it is considered as the configuration which rewrites to the specific value which sets up PID of PMT from the control means 409 by PID rewriting means 433 in the example of drawing 8, and records a signal on the record regeneration means 423. Since PID of PMT is beforehand known when this reproduces the recorded signal, the picture described by PMT, voice, and PID of PCR can acquire immediately, and it can reproduce immediately, without a user doing complicated operation like the case where it is the example of drawing 1.

[0024] The 5th example of this invention is shown in drawing 9. That that the example of drawing 9 differs from the example of drawing 8 extracts by the 2nd demultiplexing section 413 is the point considered as the configuration which rewrites PID of PCR, a picture, and voice to the specific value set

up from the control means 409 by PID rewriting means 433 while it is made only the information on PCR, a picture, and voice.

[0025] While the amount of information which can reproduce immediately and is recorded can be made fewer than the case of the example of drawing 8, without a user doing complicated operation like the case of the example of drawing 1 since PID of PCR recorded at the time of regeneration, a picture, and voice is known beforehand according to the example of drawing 9, the configuration of the 2nd demultiplexing section 413 can be simplified.

[0026] The 6th example of this invention is shown in drawing 10. That the example of drawing 10 differs from the example of drawing 9 is the point of having established the packet insertion means 453 instead of PID rewriting means 433. In the example of drawing 10, the 2nd demultiplexing section 413 extracts the aforementioned PCR, a picture, voice, etc., and inputs them into the packet insertion means 453 while it acquires PID of each informations, such as desired PCR, a picture, and voice. The packet insertion means 453 creates and inserts in an input signal the packet which described PIDs, such as PCR acquired in the 2nd demultiplexing section 413, a picture, and voice, from the 2nd demultiplexing section 413, and records it on the record regeneration means 423. When reproducing the recorded signal, a control is performed from the control means 409 so that the packet which the 1st demultiplexing means 404 inserted by the aforementioned packet insertion means 453 first may be received, and a desired program can be shown immediately, without a user doing complicated operation like the example of drawing 9, since PIDs, such as PCR described by this, a picture, and voice, are acquired. In addition, in the above-mentioned explanation, you may give the PID same as PID of the packet inserted by the packet insertion means 453 as PAT specified by MPEG 2 specification. In case the signal which it reproduced from the record regeneration means 423 in the 1st demultiplexing means 404 since it was specified that PID of PAT considers as a specific value in MPEG 2 specification is processed, the operation explained using drawing 10 by setting up beforehand so that the 1st demultiplexing means 404 may be controlled to extract the packet in which the control means 409 has the same PID as PAT first can be realized.

[0027] A desired program can be shown immediately, without a user doing complicated operation by using the example of drawing 10, as explained above.

[0028] The 7th example of this invention is shown in drawing 11. In drawing 11, 463 is a transmission rate detection means. In drawing 11, the 2nd demultiplexing means 413 extracts addition data, such as a program information, with informations, such as a picture and voice, as well as the case of the example of the drawing 1 or the drawing 5. TS outputted from the 2nd demultiplexing means 413 is inputted into the transmission rate detection means 463. When it is detected that the transmission rate of an input TS exceeded the specific value set up beforehand in the transmission rate detection means 463, the transmission rate detection means 463 outputs the signal which notifies the control means 409 of the purport that the transmission rate exceeded the value set up beforehand. If the notice signal from the transmission rate detection means 463 is inputted, the control means 409 will control the 2nd demultiplexing means 413, and will control it not to extract the information which does not influence a presentation of a program directly according to the priority set up beforehand. That is, when the transmission rate of TS outputted, for example from the 2nd demultiplexing means 413 exceeds the value set up beforehand, the transmission rate of the multiplexed signal outputted from the 2nd demultiplexing means 413 by stopping an extraction of a program information is made to become below a fixed value.

[0029] As explained above, it sets in the example of drawing 11. For example, when the record means which has an upper limit in the recordable transmission rate of a multiplexed signal as a record regeneration means 423 is used Unless the multiplexed signal to record exceeds the transmission rate set up beforehand, while additional information, such as a program information, is recorded and value added is raised with informations, such as a picture, voice, etc. which constitutes a program Even when the transmission rate of a multiplexed signal to record exceeds the transmission rate set up beforehand, a program information can be recorded by stopping an extraction of the information without regards to a presentation of the content of a program directly.

[0030] The example of the octavus of this invention is shown in drawing 12. In drawing 12, 473 is a switch means. In drawing 12, while the 2nd demultiplexing means 413 extracts the record related information in connection with protection of a copyright etc. When the information on a purport that

record is forbidden as the aforementioned record related information is extracted, the signal which the control means 409 detects that the information on a purport that record was forbidden was extracted, controls the switch means 473, and was outputted from the 2nd demultiplexing means 413 is made not to be impressed to the record regeneration means 423.

[0031] That is, when the signal which added the information on a purport that record was forbidden for the purpose, such as protection of a copyright, in a transmitting side by using the example of drawing 12 is delivered, the operation according to this can be carried out.

[0032] In addition, in the example of drawing 12, although the example which established the switch means 473 was shown in order to forbid record, even if it controls to stop a part of 2nd demultiplexing means 413 (speed-conversion means 4132 etc.) or all operations from the control means 409, it is clear that the same effect is chosen.

[0033] In addition, in an example, although the 1st demultiplexing means 404 and the 2nd demultiplexing means 413 were explained as another circuit, these two meanses are not cared about as the same circuit block.

[0034]

[Effect of the Invention] The program recorded immediately can be reproduced, without being able to record only the digital signal about a desired program etc. alternatively, and carrying out complicated operation at the time of regeneration, when the amount of information of the signal transmitted by using this invention differs from amount of information recordable on record and a regenerative apparatus, as explained above.

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[Translation done.]

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

- [Drawing 1] Drawing showing the configuration of the 1st example of this invention  
[Drawing 2] Drawing showing the multiplex system of packet structure and a packet  
[Drawing 3] Drawing showing the procedure of a program presentation  
[Drawing 4] Drawing showing the procedure of a program presentation  
[Drawing 5] Drawing showing the configuration of the 2nd example of this invention  
[Drawing 6] Drawing showing the procedure of a program presentation  
[Drawing 7] Drawing showing the configuration of the 3rd example of this invention  
[Drawing 8] Drawing showing the configuration of the 4th example of this invention  
[Drawing 9] Drawing showing the configuration of the 5th example of this invention  
[Drawing 10] Drawing showing the configuration of the 6th example of this invention  
[Drawing 11] Drawing showing the configuration of the 7th example of this invention  
[Drawing 12] Drawing showing the configuration of the example of the octavus of this invention  
[Drawing 13] Drawing showing one configuration of the 2nd demultiplexing means of this invention  
[Drawing 14] Drawing showing one configuration of the 2nd demultiplexing means of this invention

[Description of Notations]

- 300 -- Antenna 301 -- Converter 302 -- Cable 401 -- Tuner  
402 -- QPSK recovery circuit 403 -- FEC 404 -- Demultiplexing section  
405 -- MPEG 2 decoder 406 -- Video encoder 407 -- D/A converter  
408 -- OSD 409 -- Control means 410 -- Television  
413 -- The 2nd demultiplexing section 423 -- Record regeneration means 433 -- PID rewriting means  
453 -- Packet insertion means  
414, 424 -- Switch 415434 -- RAM 419 -- ROM

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[Translation done.]